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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,467	04/29/2005	Mats Dahlback	1026-0001WOUS	4111

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EXAMINER	
ROE, JESSEE RANDALL	

ART UNIT	PAPER NUMBER
1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/533,467	DAHLBACK ET AL.	
	Examiner	Art Unit	
	Jessee Roe	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *24-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *24-42* is/are rejected.

7)☒ Claim(s) *26* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/ are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *29 April 2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

Claims 24-42 are pending wherein claims 1-23 are canceled.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Objections

Claim 26 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 26 recites a recrystallization that would be higher than about 40%, which would include 100%. However, the independent claim give an upper limit of recrystallization of about 95%.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 24-32 and 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Swam et al. (US 5,844,959).

In regards to claims 24, 26, 31 and 35-37, Van Swam et al. ('959) disclose the formation of a zirconium-based alloy tube that would be used in the fuel assembly of nuclear pressure water reactors (col. 4, lines 34-44, col. 6, line 53 – col. 7, line 53 and col. 8, lines 34-67). The zirconium-based tube would contain 0.5 to 3.25 weight percent niobium and 0.3 to 1.8 weight percent tin (col. 5, lines 19-37). Van Swam et al. ('959) disclose annealing to partly recrystallize or recrystallize the tube, which would overlap in scope with and therefore read on the instantly claimed partial recrystallization of being higher than about 5% and lower than about 95% (col. 7, lines 26-53).

The Examiner notes that the composition of the zirconium-based alloy tube disclosed by Van Swam et al. ('959) overlaps the composition of the composition of the instant invention, which is a prima facie of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed amount of niobium for a zirconium-based alloy from the amount of niobium in the zirconium-based alloy disclosed by Van Swam et al. ('959) because Van Swam et al. ('959) disclose the same utility throughout the disclosed ranges.

In regards to claim 25, Van Swam et al. ('959) disclose the steps of hot rolling and heat treating the tube (col. 7, lines 21-53).

In regards to claims 27-28, Van Swam et al. ('959) disclose that the final annealing would be carried out at a temperature would be 600°C or lower, which overlaps the range of 550°C or lower and the range of about 400°C to about 540°C (col. 7, lines 26-53).

In regards to claim 29, Van Swam et al. ('959) do not specify that the time for the final anneal would be between about 1 hour and about 6 hours. However, Van Swam et al. ('959) disclose that the total amount of time for the working and heat treatments would be for 10 hours or more (col. 6, lines 22-41). Further, Van Swam et al. ('959) teach that time and temperature would be effective in the resulting precipitation of alloying elements at the grain boundaries (col. 6, lines 42-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the time and temperature of the heat treatments, which would include the final annealing step, in order to achieve the desired elemental precipitation at the grain boundaries. MPEP 2144.05 II.

In regards to claim 30, Van Swam et al. ('959) disclose forming the zirconium-based alloy into the shape of a bar from an ingot (col. 7, lines 1-20); heating the bar to a temperature of 1000°C ± 20°C for a time period of 20 to 120 minutes (col. 7, lines 1-20); rapidly quenching to a temperature below 250°C (col. 7, lines 1-20); extruding to form a hollow billet while heating to a temperature between 500°C and 600°C (col. 7,

lines 2-53); and bringing the zirconium-based alloy to its final dimension by subsequent (at least two) cold rolling steps with intermediate annealing below 600°C, which reads on the instantly claimed process (col. 7, lines 21-25).

In regards to claims 32 and 38, Van Swam et al. ('959) disclose that the oxygen would be in the range of 400 to 1000 ppm, which overlaps the range of about 800 ppm to about 1700 ppm (col. 6, lines 53-67).

Claims 33-34 and 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentableover Van Swam et al. (US 5,844,959), as applied to claim 24 above with evidence from Easterday (Zirconium Analysis by Production Control Quantometer).

In regards to claims 33 and 39, Van Swam et al. ('959) disclose that the zirconium alloy would contain trace or impurity elements, but Van Swam et al. ('959) do not specify the amount of the impurity elements that would be present.

Easterday discloses that zirconium would contain 200-2000 ppm iron impurity (Table I).

Therefore, it would be expected that the zirconium-based alloy having trace or impurity elements, as disclosed by Van Swam et al. ('959) would contain 200-2000 ppm iron, as disclosed by Easterday, because Easterday discloses the concentration of metallic impurity elements in zirconium (Table I).

In regards to claims 34 and 40, Van Swam et al. ('959) disclose the formation of a zirconium-based alloy tube that would be used in nuclear pressure water reactors (col. 6, line 53 – col. 7, line 53 and col. 8, lines 34-67). The zirconium-based tube would contain 0.5 to 3.25 weight percent niobium; 0.3 to 1.8 weight percent tin (col. 5, lines

19-37); 400 to 1000 ppm oxygen (col. 4, lines 18-33); 50 to 200 ppm carbon (col. 6, lines 53-67); and 30 to 150 ppm silicon (col. 4, lines 18-33). Van Swam et al. ('959) do not necessitate the addition of sulfur.

Van Swam et al. ('959) disclose that the zirconium alloy would contain trace or impurity elements, but Van Swam et al. ('959) do not specify the amount of the impurity elements that would be present.

Easterday discloses that zirconium would contain 200-2000 ppm iron impurity (Table I).

Therefore, it would be expected that the zirconium-based alloy having trace or impurity elements, as disclosed by Van Swam et al. ('959) would contain 200-2000 ppm iron, as disclosed by Easterday, because Easterday discloses the concentration of metallic impurity elements in zirconium (Table I).

Claims 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Santen et al. (US 3,607,639) in view of Van Swam et al. (US 5,844,959).

In regards to claims 41-42, Santen et al. ('639) disclose a fuel assembly comprising a top plate, a bottom plate, spacer elements for maintaining the rods at suitable distances from each other, and guide tubes that extend between the top plate and the bottom plate (col. 2, line 36 - col. 3, line 49). Santen et al. ('639) further specify that the tube would be madet of a zirconium alloy and the tubes would contain UO_2 ceramic nuclear fuel (col. 2, lines 36-54). However, Santen et al. ('639) do not specify all possible zirconium alloy compositions that would be used for the tube.

Van Swam et al. ('959) disclose the formation of a zirconium-based alloy tube that would be used in the fuel assembly of nuclear pressure water reactors (col. 4, lines 34-44, col. 6, line 53 – col. 7, line 53 and col. 8, lines 34-67). The zirconium-based tube would contain 0.5 to 3.25 weight percent niobium; 0.3 to 1.8 weight percent tin (col. 5, lines 19-37); 400 to 1000 ppm oxygen (col. 4, lines 18-33); 50 to 200 ppm carbon (col. 6, lines 53-67); and 30 to 150 ppm silicon (col. 4, lines 18-33). Van Swam et al. ('959) disclose annealing to partly recrystallize or recrystallize the tube, which would overlap in scope with and therefore read on the instantly claimed partial recrystallization of being higher than about 5% and lower than about 95% (col. 7, lines 26-53). This alloy composition would result in increased resistance to aqueous corrosion relative to that of Zircaloy (col. 4, lines 4-17).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the zirconium-based alloy tube, as disclosed by Van Swam et al. ('959), in the fuel assembly comprising a top plate, a bottom plate, spacer elements for maintaining the rods at suitable distances from each other, as disclosed by Santen et al. ('639), in order to increase resistance to aqueous corrosion, as disclosed by Van Swam et al. ('959) (col. 4, lines 4-17).

Claims 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lorek et al. (US 5,323,434) in view of Van Swam et al. (US 5,844,959).

In regards to claims 41-42, Lorek et al. ('434) disclose a fuel assembly comprising a top plate, a bottom plate, spacer elements for maintaining the rods at suitable lateral distances from each other, and guide tubes that extend between the top

plate and the bottom plate (col. 1, lines 6-20). Lorek et al. ('434) further specify that the tube would be made of a zirconium alloy and the tubes would contain UO_2 nuclear fuel for a nuclear water reactor (col. 1, lines 6-20 and col. 3, lines 29-52). However, Lorek et al. ('434) do not specify all possible zirconium alloy compositions that would be used for the tube.

Van Swam et al. ('959) disclose the formation of a zirconium-based alloy tube that would be used in the fuel assembly of nuclear pressure water reactors (col. 4, lines 34-44, col. 6, line 53 – col. 7, line 53 and col. 8, lines 34-67). The zirconium-based tube would contain 0.5 to 3.25 weight percent niobium; 0.3 to 1.8 weight percent tin (col. 5, lines 19-37); 400 to 1000 ppm oxygen (col. 4, lines 18-33); 50 to 200 ppm carbon (col. 6, lines 53-67); and 30 to 150 ppm silicon (col. 4, lines 18-33). Van Swam et al. ('959) disclose annealing to partly recrystallize or recrystallize the tube, which would overlap in scope with and therefore read on the instantly claimed partial recrystallization of being higher than about 5% and lower than about 95% (col. 7, lines 26-53). This alloy composition would result in increased resistance to aqueous corrosion relative to that of Zircaloy (col. 4, lines 4-17).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the zirconium-based alloy tube, as disclosed by Van Swam et al. ('959), in the fuel assembly comprising a top plate, a bottom plate, spacer elements for maintaining the rods at suitable lateral distances from each other, as disclosed by Lorek et al. ('434), in order to increase resistance to aqueous corrosion,

as disclosed by Van Swam et al. ('959) (col. 4, lines 4-17).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571) 272-5938. The examiner can normally be reached on Monday-Friday 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JR

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